

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/796,938

First named inventor: Ron Naftali

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Examiner: Liu, Michael

Docket No.: 009157 USA/PDC/EZILBER

Confirmation No.: 4473

Commissioner for Patents  
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**APPEAL BRIEF**

Sir:

This brief is submitted in support of the instant appeal from a Final Office Action dated 14 September 2010, an Advisory Action dated September 14, 2010 and further to a Notice of Appeal filed 7 October 2010.

If there are any additional fees due in connection with this communication, please charge Deposit Account No. 19-3140.

Respectfully submitted,  
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## **REAL PARTY IN INTEREST**

The real party in interest in the present appeal is the Assignee, Applied Materials, Inc. The assignment was recorded in the U.S. Patent and Trademark Office at Reel 016774, Frame 0487.

## **RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

## **STATUS OF CLAIMS**

Claims 1, 3 and 4 are pending, have been finally rejected, and are the subject of this appeal. In particular, claims 1 and 3 stand rejected under 35 USC 112, second paragraph and claims 1, 3 and 4 stand rejected under 35 USC 103 as being obvious over *Lu*, US Patent 7,022,452.

Claims 2 and 5-9 have been cancelled.

The claims on appeal are presented in the Claims Appendix.

## **STATUS OF AMENDMENTS**

There are no presently pending amendments. Claims 1, 3 and 4 are presented on appeal in their amended form as of 7 October 2010.

## **SUMMARY OF THE CLAIMED SUBJECT MATTER**

Claim 1 is the sole independent claim pending in this application and recites:

A method for recording a pattern, comprising: (See, Specification, Para. [0020]).

determining an illumination scheme in response to the pattern; (See, Specification, Para. [0020]).

directing, in response to the determination, at least one focused beam of radiation having a first cross-section through an objective lens onto an intermediate layer, said intermediate layer comprising a saturable absorber, said saturable absorber configured to allow only a portion of said beam, said portion having a second cross-section, to propagate towards a radiation sensitive layer, said second cross-section being smaller than the first cross-section; and (See, Specification, Para. [0020]).

removing said intermediate layer after the pattern has been printed. (See, Specification, Para. [0021])

## **ISSUES TO BE REVIEWED ON APPEAL**

The issues presented for review are

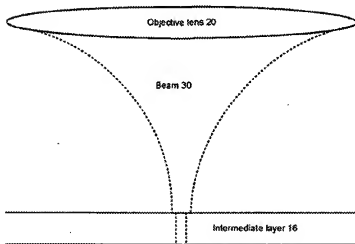
- 1) Whether claims 1 and 3 were properly rejected 35 U.S.C. 112, second paragraph.
- 2) Whether claims 1, 3 and 4 were properly rejected under 35 U.S.C. 103 as being unpatentable in view of *Lu*, US Patent 7,022,452.

## ARGUMENT

*1. The claims are allowable in view of 35 USC 112, second paragraph.*

The Office Action contends that the language reciting “at least one focused beam of radiation having a first cross-section through an objective lens onto an intermediate layer” is unclear and indefinite because the claims recite that the first cross section is located at the objective lens and the specification discloses that the first cross section is located at the incident plane of the saturable absorber. See, Office Action of July 7, 2010 at Page 4.

This assertions is simply incorrect. Paragraph [0015] of the specification states “A beam of radiation 30 is focused, by an objective lens 20, substantially onto an intermediate layer 16 that includes saturable absorbers.” See, Specification, Para. [0015]. In addition, Figure 1 of the application depicts a beam of radiation 30 focused by an objective lens 20 onto an intermediate layer 16 as shown below:



As the figure depicts, a focused beam 30 having a first cross section is focused through an objective lens 20 onto an intermediate layer 16 as disclosed in the specification at Paragraph [0015]. Further, Paragraph [0020] of the specification discloses the first cross section being towards a saturable absorber that is located in the intermediate layer. See, Specification, Paras. [0015] and [0020]. Accordingly, the specification and figures support at least one focused beam 30 of radiation having a first cross-section through an objective lens 20 onto an intermediate

layer 16 because the first cross section is the portion of the beam passing through the objective lens 20 that is on the intermediate layer 16.

The Examiner also alleges that the figures do not show that the second cross section is about half of the second cross section as recited in claim 3. As discussed previously, the claims recite the first cross section beam being the portion of the beam on the intermediate layer 16. Accordingly, the Figure 1, as depicted above, clearly show that the second cross section is about half the size of the first cross section.

## **2. Claim 1 is not unpatentable in view of Lu.**

In relevant part, claim 1 recites

“directing, in response to the determination, at least one focused beam of radiation having a first cross-section through an objective lens onto an intermediate layer, said intermediate layer comprising a saturable absorber, said saturable absorber configured to allow only a portion of said beam, said portion having a second cross-section, to propagate towards a radiation sensitive layer, said second cross-section being smaller than the first cross-section.”

*Lu* discloses a contrast enhancing layer formed on a photoresist layer where deep ultraviolet (“DUV”) radiation is filtered by a barrier layer such the contrast enhancing layer is only exposed to (“DUV”) radiation having a wavelength of about 230-300 nm which causes the contact enhancement layer to become transparent to the exposed DUV radiation. See, U.S. Pat. No. 7,022,452, col. 3, l. 50 - Col. 4, l. 29. Further, *Lu* discloses that the center portions of the exposed layer “bleaches” more rapidly than the outer portions of the layer which allows the higher intensity radiation in the range to reach the photoresist layer first. See, U.S. Pat. No. 7,022,452, Col. 4, l. 30-55.

It **would not have been** obvious for one having ordinary skill in the art to use the contact enhancement layer of *Lu* to reduce the cross section of a beam. *Lu* fails to disclose using an objective lens to focus radiation into a beam as required by the claims. Instead, *Lu* discloses a filter that only allows radiation having a wavelength of 230-300 nm to pass to the contact enhancement layer. See, U.S. Pat. No. 7,022,452, col. 3, l. 30-34. This cannot be fairly viewed as disclosing an objective lens that focuses radiation into a beam that strikes a surface of an intermediate layer because *Lu* merely discloses filtering radiation to a specific wavelength which does not result in any focusing of the radiation. As one having ordinary skill in the art would

recognize, filtering of radiation is not synonymous with focusing radiation and does not produce the same results.

Since *Lu* fails to disclose a beam focused by an objective lens it cannot be fairly viewed as disclosing a cross section of a beam exiting a layer being smaller than a cross section of the beam entering the layer. *Lu* discloses filtering radiation, opposed to focusing radiation into a focused beam, which results in the entire layer being exposed to radiation having a wavelength of 230-300 nm. See, U.S. Pat. No. 7,022,452, col. 3, l. 50 - Col. 4, l. 29. Accordingly, *Lu* discloses multiple unfocused beams of radiation striking the surface of a contact enhancement layer where some of the beams pass through the layer at a faster rate than others due to the lag in the transparency adjustment of the contact enhancement layer. See, *Id.* This cannot be fairly viewed as disclosing a focused beam with a cross section that is reduced by a saturable absorber because *Lu* merely discloses unfocused radiation beams passing through a contact enhancement layer at variable rates without any change to their cross sections.

Therefore because *Lu* fails to disclose or even suggest all the features of claims 1, 3 and 4, the rejection of claims 1, 3 and 4 cannot stand.

## **CONCLUSION**

For at least the foregoing reasons, the present rejections of the claims should be reversed.

## CLAIMS APPENDIX

1. A method for recording a pattern, comprising:
  - determining an illumination scheme in response to the pattern;
  - directing, in response to the determination, at least one focused beam of radiation having a first cross-section through an objective lens onto an intermediate layer, said intermediate layer comprising a saturable absorber, said saturable absorber configured to allow only a portion of said beam, said portion having a second cross-section, to propagate towards a radiation sensitive layer, said second cross-section being smaller than the first cross-section; and
  - removing said intermediate layer after the pattern has been printed.
3. The method of claim 1 wherein the second cross-section is about half of the first cross-section.
4. The method of claim 1 further comprising altering an intensity of the beam of radiation to achieve a certain second cross-section.

## **EVIDENCE APPENDIX**

None.



## **RELATED PROCEEDINGS APPENDIX**

None.